

**REMARKS**

The Office action dated August 27, 2003 and the cited references have been carefully considered.

**Status of the Claims**

Claims 1-25 and 39-46 are pending. Claim 3 is canceled. Therefore, claims 1, 2, 4-25 and 39-46 remain in the current prosecution.

Claims 12 and 18 are objected to as not being in a usual claim structure. Claims 12 and 18 are now presented in the usual claim structure, and now overcome this objection.

Claims 1-25 and 39-46 are rejected as being unpatentable over Sugiyama (JP Publication 57-096,453; hereinafter "Sugiyama") in view of Lal (U.S. Patent 6,451,175). Claim 3 has been canceled. Therefore, the rejection of claim 3 is now moot. The Applicants respectfully traverse the rejection of the remaining claims 1, 2, 4-25, and 39-45.

**Claim Rejection Under 35 U.S.C. § 103(a)**

Claims 1, 2, 4-25, and 39-46 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugiyama in view of Lal. The Applicants respectfully traverse this rejection because Sugiyama's teaching clearly does not motivate one of ordinary skill in the art to use carbon nanotubes. Moreover, Sugiyama clearly discourages coating of the mixture on the electron emitter filament.

"[T]he legal conclusion of obviousness [under 35 U.S.C. § 103(a)] requires that there be some suggestion, motivation, or teaching in the prior art whereby the person of ordinary skill would have selected the components that the inventor selected and used them to make the new device." *C.R. Bard, Inc. v. M3 Systems, Inc.*, 48 U.S.P.Q.2d 1225, 1231 (Fed. Cir. 1998). Thus, a reference does not provide a motivation to select the elements of the claim if it warns against using them. *In re Gurley*, 31 U.S.P.Q.2d 1130, 1131 (Fed. Cir. 1994) ("A reference [is] said to teach away when a person of ordinary skill, upon reading the

reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.").

Sugiyama discloses that proper carbon fibers for his invention should have a thickness (the Applicants understand this term to be a diameter) between 10 microns and 90 microns. Translation of Sugiyama, paragraph 7, page 4. This dimension is on the order of 1000 times larger than the carbon nanotube diameter of the instant claims. Since Sugiyama discloses that a proper thickness of his carbon fibers should be on the order of 1000 times larger than carbon nanotubes, a person of ordinary skill in the art would be led away from using carbon nanotubes having a diameter in the range of nanometer, as is recited in claims 1, 2, 4-25, and 38-46. Similarly, one of ordinary skill in the art would not have considered Lal's carbon nanotubes to replace Sugiyama's carbon fibers because of Sugiyama's strong suggestion of using carbon fibers in the range of 10-90 microns.

Moreover, Lal merely discloses a method of making, and the good mechanical strength of, carbon nanotubes. Nowhere does Lal disclose or suggest electron emission property of carbon nanotubes. Therefore, in view of the fact that Sugiyama teaches away from using carbon nanotubes having nanometer sizes, a person of ordinary skill in the art would not have a motivation to use Lal's carbon nanotubes in Sugiyama's electrical device.

Since a motivation to combine Sugiyama and Lal is completely absent, claims 1, 2, 4-25, and 39-46 are patentable over Sugiyama in view of Lal.

In addition, Sugiyama teaches away from coating the carbon fiber mixtures on an electrode. Translation of Sugiyama, paragraph 2, page 2 (Sugiyama's invention "has an advantage of a long useful life for its having much emitter substance than an electrode in which the emitter substance is coated on the surface of a tungsten filament.") Therefore, there is no motivation to modify Sugiyama to coat the electrode filament with the electron emission mixture, as is recited in claims 12-25 and 43-46. Since Sugiyama teaches away from coating the electrode filament with the mixture, Lal's disclosure of carbon nanotubes becomes moot. Therefore, claims 12-25 and 43-36 are patentable over Sugiyama, even if Lal is considered.

The Applicants respectfully traverse the Examiner's Official Notice that "carbon nanotubes have been recognized as an attractive electron-emitting alternative to carbon fibers." The Examiner's statement is merely another attempt to justify his substitution of Sugiyama's carbon fibers with carbon nanotubes. The issue is not whether carbon nanotubes generally have been recognized as electron emitters, but whether under 35 U.S.C § 103(a) one of ordinary skill in the art would have substituted carbon fibers with carbon nanotubes in Sugiyama's device, in view of Sugiyama's strict teaching of proper carbon fiber diameters. As the Applicants pointed out above, Sugiyama clearly discourages the use of anything other than carbon fibers in the range of 10 nm to 90 nm. Therefore, there is no motivation to substitute Sugiyama's carbon fibers with carbon nanotubes of the instant claims.

Moreover, the Applicants respectfully traverse the Examiner's taking Official Notice of the alleged knowledge that "carbon nanotubes have been recognized as an attractive electron-emitting alternative to carbon fibers" because this alleged knowledge is not "capable of instant and unquestionable demonstration as to defy dispute." M.P.E.P. 2144.03 (8<sup>th</sup> ed., rev. 1, Feb. 2003) (quoting *In re Knapp Monarch Co.*, 132 U.S.P.Q. 6 (C.C.P.A. 1961)). In *In re Eynde*, 178 U.S.P.Q. 470, 474 (C.C.P.A. 1973), the Court of Customs and Patent Appeal declared:

"[W]e reject the notion that judicial or administrative notice may be taken of the state of the art. The facts constituting the state of the art are normally subject to the possibility of rational disagreement among reasonable men and are not amenable to the taking of such notice." (emphasis added).

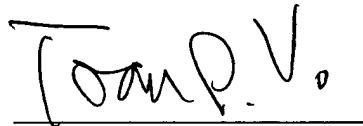
Furthermore, M.P.E.P. 2144.03 further admonishes the Examiner that "assertions of technical facts in the area of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art.

None of the references that the Examiner has cited is capable of instantly and unquestionably demonstrating that carbon nanotubes are alternatives to carbon fibers for emitting electrons. When the Examiner seeks to rely upon a scientific theory, in establishing a prima facie case of obviousness, he/she must provide evidentiary support for the existence and meaning of that theory. *In re Grose*, 201 U.S.P.Q. 57, 63 (C.C.P.A. 1979). Here, the Examiner has not offered any explanation of the scientific theory that

would support his assertion that carbon nanotubes are "attractive alternatives" to carbon fibers, especially in view of the fact that none of the cited references teaches or suggests this substitution. Therefore, the Examiner's taking of the Official Notice is improper and cannot support a determination of obviousness of the instant claims.

In view of the above, it is submitted that the claims are patentable and in condition for allowance. Reconsideration of the rejection is requested. Allowance of claims at an early date is solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Toan P. Vo", is written over a horizontal line.

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